



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/585,061	06/01/2000	Samuel M.D. Norville	9105-3/JMD	5737

7590 08/18/2004

James M Durlacher  
Woodard Emhardt Naughton Moriarty and McNett  
Bank One Center/Tower Suite 3700  
111 Monument Circle  
Indianapolis, IN 46204-5137

EXAMINER

LIN, KUANG Y

ART UNIT PAPER NUMBER

1725

DATE MAILED: 08/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/585,061	<b>Applicant(s)</b> NORVILLE ET AL.	
	<b>Examiner</b> Kuang Y. Lin	<b>Art Unit</b> 1725	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-19, 24-26 and 31-38 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19, 24-26 and 31-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-19, 24-26 and 31-38 are rejected under 35 U.S.C. as being unpatentable over U.S. patent no. 5,098,487 to Brauer et al and further in view of applicant's admitted prior art as set forth in page 1 of the specification.

Brauer et al. shows a die casting method by cooling a molten metal in a vessel and stirring the same with either a mechanical means or an electromagnetic means to form a semi-solid slurry, discharging the slurry into a casting chamber which contains insulated wall and may include an induction heating means (see col. 8, lines 17-50 and figure 6) and injecting the slurry in the casting chamber into a die cavity to form a casting. In short, Brauer et al substantially show the invention as claimed except that they do not refer the slurry discharged from the

vessel to the shot sleeve as a "slurry billet". However, the admitted prior art as set forth in page 1 of the specification discloses that "the semi-solid material is typically referred to as a "slurry" and the slug which is produced as a "single shot" is also referred to as a billet." Since in each casting cycle the size of slurry of Brauer et al discharged from the vessel of stirring system 58 into the shot sleeve is just large enough for casting a single casting article (a single shot), the slurry of Brauer et al is also called as a slurry billet. With respect to the claimed limitation of "without any heating step subsequent to the discharging from said vessel", it would have been obvious that an induction heating means for heating the casting chamber is not required shall the insulated wall is sufficient to prevent solidification of the slurry prior to the same being injected into the die cavity. With respect to claims 2-8 and 26, the specific casting cycle time for a particular alloy system depending on the molten metal composition, the grain size of the solid and the solid fraction in the slurry and thus the final product to be obtained, the cooling rate, the balance between the acceptable quality of the product and the cost, etc., and thus would have been obvious for those of ordinary skill in the rheocasting art to obtain the optimal casting cycle time through routine experimentation. With respect to claims 9 and 16, it would have been obvious to use a transferring device for delivering molten metal to the vessel when the molten metal was melted at different location than the caster. Since it is nowadays to use robot to replace the manual work for carrying out the routine operation, it would have been obvious to use a robot for transferring molten metal

in the process of Brauer et al. to facilitate the casting process. With respect to claims 10 and 13, it would have been obvious to set up the stirring system 58 of Brauer et al. ready for processing the molten metal before pouring the same therein and thereby to speed up the casting process. With respect to claims 11, 12, 14, and 15, it is a common knowledge that the heat transfer process can be regulated through the use of cooling means, heating means or insulating means. Thus, it would have been obvious to regulate the cooling rate of molten metal in the vessel of Brauer et al. through the use of cooling means, heating means, or insulating means. It is a common practice to use robot to replace the manual work for carrying out the routine operation. With respect to claims 17 and 18, it is a common practice to electromagnetically stir the molten metal to cause the same to flow either circumferentially or longitudinally (see applicant's admitted prior art as set forth in junction paragraph between pages 7 and 8 of the specification) to obtain a designated result. With respect to claim 19, it is conventional to add reinforcement particles into molten metal before casting such that to form a metal matrix composite article if the composite article is designated. With respect to claim 31-34, it would have been obvious to change any power supply parameter to control the strength of the EM field in response to the required strength of the stirring force and thereby to regulate the shear rate in the molten metal for forming the designated configuration of the solid particle in the slurry. With respect to claims 35 and 36, it is conventional to provide a cover in a EM stirring apparatus for preventing molten metal from spilling out of the apparatus during

stirring. Further, it is a common practice to use a temperature sensing means to detect the molten metal temperature in the vessel such that to regulate the casting process. With respect to claim 38, since it is convention to use different type of electromagnetic stirrer for generating a flow in either transverse or longitudinal direction (as admitted in the junction paragraph between pages 7 and 8 of the specification), it would have been obvious to arrange any combination of different type of conventional stirrers and thus to create more turbulent flow pattern and thereby to obtain a synergetic result.

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-19, 24-26 and 31-38 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19, 24-26 and 31-38 of copending Application No. 10/617,307. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed disclosure of the co-pending application discloses the invention as claimed.

Art Unit: 1725

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuang Y. Lin whose telephone number is 571-272-1179. The examiner can normally be reached on Monday-Friday, 10:00-6:30,.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas X Dunn can be reached on 571-272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kuang Y. Lin  
Primary Examiner  
Art Unit 1725

8-11-04